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A Clinical Study of Swarnaprashana on Mental Development Of School Going Children.

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Abstract

Childhood marks a big introduce a person's being's life and is usually attributed as a crucial factor which influences his growth and development. In today's world, the importance of childcare are often found diminishing due to the new lifestyle conditions that diverge from the normal childrearing practices that ensured health and well-being of a child from infancy to adulthood.

The ancient wisdom of Ayurveda aims at a holistic well-being of a private by nurturing each stage of life. In classical Ayurveda texts, aspects of take care of early phases of life are integrated under childcare practices that are directed towards healthcare routines, building immunity and longevity.

We have formulated a singular approach to childcare that befits children's needs by integrating the physical and psychological care required in childhood, this holistic approach forms the requisite for the health and well-being of a child.

As per Ayurveda, the expansion stages of a toddler is split into five supported the age and developmental changes in his body. Ayurveda prescribes efficient therapies and coverings alongside lifestyle changes, dietary habits and exercises for every of those phases to assist build a correct health care regime appropriate for the growing child.

Key words: Swarnaprashana, Mental Development, School Going Children

Introduction

Ayurveda, an intellectually coherent organized medical system of a country which laid stress on the promotion of health and prevention of health and prevention of the disease more than the treatment part with fiber of social medicine and morals interwoven makes it preeminently suitable for the community restoration of positive health and eradication of disease is first and foremost aim of Ayurveda. Various health care regimen is practiced in India to obtain healthy offspring and Ayurveda is the treasure for it. Lehana or Prashana is one such noble method specially mentioned for children[1]. With the aim to boost their immunity and overall health including higher mental health classical references are available on this in Ayurvedic treaties like Kashyap Samhita Sutra sthan 18th chapter, Astang Hridaya Uttar sthan and Sushruta Samhita sharira sthan. It is mentioned to rub specified herbal drugs with that of Suvarna (Gold) on stone and to be given to the child with ghee and honey from the 1st day of life itself. The procedure would aid in enhancing the intellect, digestion power, longevity of life and complexion, protect child from recurrent infection and promotes intelligence[2].

In the general population 2 to 3 percent children have an IQ below 70. Nearly three forth of such cases are mildly handicapped. This mental subnormal condition is due to interplay of several biomedical, socio-cultural and psycho logic factors.

Swarnaprashana is one of the sixteen 'Samskara' which described in Ancient Indian scripture. To lick Gold to the child is originally 'Swarnaprashana'[1].

According to Kashyap Samhita

xNhÉÉÉÉ½¼ÉÉÉ½¼ÉÉÉÉÉÉÉÉ|

AÉÉÉÉÉÉÉÉÉÉÉÉÉÉÉÉ||

qÉÉÉÉÉÉÉÉ uÉÉÉÉÉcÉÉÉÉ|

vÉÉÉÉÉÉ xÉÉÉÉ xNhÉÉÉÉÉ uÉ|

MÉ xÉxÉ 8 / 4 - 5

It is mixture of gold such nice herbs, cow ghee (Goghrita) and honey administer in specific time.

Keywords- Swarnaprashana, Mental Development, IQ, Lehana

Materials and Methods-

The present study comprises of following phases:

- Historical Review
- Clinical Study
- Discussion
- Conclusion
- References

Historical Review:

If we go back to the history of mental development in the arena of intelligence or buddhi we will have a clear picture of its importance since Vedic through Samhita period.

Samhita period -

Kashyap Samhita

❖ *Swarna prashana* is considered as *Medha-vardhak* by giving it to the child for one month. [16]
❖ Milk is considered as Buddhi-vardhak. [17]
❖ Shatpushpa is considered as Medha Janak.[18]
❖ Beside above, different formulations have been described in lehadhaya to boost up the Medha and immunity of the children.[23-26]

Medha in Brihattrayi -

A) Charak Samhita

❖ Buddhi is related to Gyan and Smriti.[18]*Chetana, Dhriti*, Ahankara etc. guna of Atma are included under Buddhi. [14] Giving importance to Buddhi in attaining knowledge. Buddhi is described as eyes and shastra as candles[15]

❖ Two types of Buddhihave been described as:
  • Sahaj vishudha buddhi
  • Sahaj Vinayakabuddhi

❖ Sahaj Vishudhabuddhi is one which is natural to an individual.

❖ Sahaj vainayaki buddhi is one which develops after studying various texts.[15]

❖ Buddhi is a factor helps in deciding which is beneficial or harmful to individual. [16]Buddhi is described as Deepaka and as a responsible factor to differentiate yatharth from ayatharth. [17]

❖ Different names are given to buddhi according to the source i.e., Chakshu buddhi is acquired by Chakshurindriya, depending upon the co-ordination between Atma, Indriya, Mana, Artha there are various types of Buddhi.[22]

B) Sushruta Samhita

❖ Medha is described as an ability to acquire the texts.[18a]

❖ Dhriti
  • Described as satisfaction of Mana.
  • Niyamatmika Buddhi.[18b]

❖ Smriti
  • Described as recollection of the things which are already experienced.[18c]
  • Ability to retain the meaning.[18d]
  • Recalling of experienced things that past.[10]

❖ Mati
  • Special type of Buddhi which hints about "Yet to come" things.
  • It comprises past, present and future Buddhi.[18e]

❖ Aspects of Medha according to Prakriti
  ▪ Vataj Prakriti-Unstable mind
  ▪ Pittaja Prakriti – Intelligent
  ▪ Kaphaj Prakriti-Mind with good retention power.[11]
  ▪ Medhaker Gana
  ▪ Regular study
  ▪ Discussion
  ▪ Consulting texts of other disciplines
  ▪ Serving the teacher of concerned faculty.[12]

❖ Buddhi which is attained from all aspects unobstructed, definite and minutely explored has been called as Medha.[9]

C) AshtangaHridaya:

❖ Buddhiman-person with special intelligence and sharp mind. [1]
Dheemata-having intelligence or Buddhi.[2]
Smriti-Recalling of past.[3]

❖ Dhee-Buddhi intellect or ability to acquire the things.[4]
                              OR
Ability to acquire the taught things. [5]

❖ Smriti-Recalling   the   past   thoughts.[6]

OR

Retaining the acquired factors after editing them.[7]

❖ Medha- Acquiring all the things without any addition and deletion.[8]

• Retention power[9]

❖ After analyzing the references of Medha in Brihattrayi, it can be concluded that Medha is composed of three factors.

Dhee   Dhriti Smriti

Factors responsible for Mental development

The factorswhich aresomehowresponsible for child's mental development in early age

- Sensitive Period
- Early Learning
- Emotional Deprivation.

Intelligence quotient (IQ)

An intelligence quotient or IQ is a measure of relative intelligence[30] determined by a standardized test. The first intelligence test was created in 1905 by Alfred Binet and Theophile Simon.

▯ Low IQ and Mental Retardation:

5 % of people have an IQ under 70 and this is generally considered as the benchmark for "mental retardation" a condition of limited mental ability in that it produces difficulty in adapting to the demands of life.

Severity of mental retardation can be broken into following levels.[31]

70 – 85 Borderline mental retardation

50 – 69	Mild mental retardation (85%)
35 – 49	Moderate mental retardation (10%)
20 – 34	Severe mental retardation (4%)
IQ < 20	Profound mental retardation (1%)

The Good-enough 'Draw-a-man' Test

The formal beginning of drawing in and its use for psychological assessment is known to begin with Florence Goodenough a child Psychologist in 1926.

The child is asked to draw a man, taking his own time. He must give his best performance. This test is reasonably reliable and correlates well with the Binet tests. It is more suitable between 3-10 yr. of age.

Scoring: Give one point for each of the items present in his drawing. For each 4 points, 1 year in added to the basal age which is 3 years e.g., if child shows 10 items his mental age score is 3 + 10/4 = 5 ½ years.

Drug Review

The details of the drugs are as follows:

- ▢   Swarna Bhasma[32]
- ▢   Madhu (Honey)[51-60]
- ▢   Ghrita (Ghee)
- ▢   Vacha (Acorus calomus)[34]
- ▢   Apamarg (Achyranthus Aspera)[35]
- ▢   Haritaki (Terminalia Chebula)[36]
- ▢   Vidanga (Embella)[37]
- ▢   Shati (Hedychium Spicatum)[38]
- ▢   Sunthi (Zingiber officinale)[39]
- ▢   Guduchi (Tinosporacordifolia)[53-59]
- ▢   Shankhpushpi (Convolvulus pluricaulis)[40-50]

Selection of formulation and drug doses:

The appearance, smell and most importantly the taste of the drug will decide this acceptability in children of smaller age group, the powder form of drug was taken with Ghrita, Madhu for this trial work. Madhu masks the bitter taste of the drug, makes the dose fixation easier and is found to be well accepted in pediatric age group.

Materials and Methods -

Clinical Study

Inclusion Criteria:

- ❖ Healthy school going children with age group of 7 - 9 yrs. in both sexes were considered for the study.
- ❖ Healthy school going children with number of average and below average school performance children with IQ above 70 were in corporate in study.

Exclusion criteria:

- ❖ Below 7 years and above 9 years.
- ❖ Chronic systemic and infectious diseases. Hepatic dysfunction.
- ❖ Blood dyscrasis on long term immunosuppressants
- ❖ Mental retardation and cerebral palsy.
- ❖ Children with progressive and non-progressive neuromuscular disorders.
- ❖ Psychiatric disorders
- ❖ Protein Energy Malnutrition

Discontinuation Criteria**:**

- ❖ Any acute or severe illness
- ❖ If the condition of the patients detoriates during the trial.

Criteria for study

- ❖ IQ level more than 70% was taken for study.

Protocol of Research:

Consent of the Patient's Parents / Guardians

- ❖ Written and informed consent of the patient's parents and guardians was taken before the trial.

Selection of patients:

❖ 30 patients were selected in the age groups of 7 to 9 yrs. through school performance.
❖ 30 patients were selected in the age groups of 7 to 9 yrs. through school performance test of children.

Grouping of Patients:

❖ Selected 60 patients were divided in to two groups.
  o Group A   :   30 patients
  o Group B   :   30 patients

Group A   Group B

Swarna Bindu   Distilled water
Dose: 5 drops   Dose: 5 drops
Duration 1-month   Duration: 1 month
Route: Oral   Route: Oral

Assessment criteria:

Assessment of IQ was done with the help of two tests.

❖ School performance test.
❖ Good enough "Draw A Man Test"
❖ Assessment of Manas Bhavas like Medha, Buddhi (Dhi, Dhruti, Smruti)

The general formula for assessing IQ is:

Mental age / Chronological age X 100.

After assessing IQ. Subjects with 70% or higher IQ were taken for trial. After that the trial drug i.e., Swarnaprashana Kalpwas given to the subjects for 30 days with follow up of 30 days interval. After 30 days IQ of the subjects was again assessed to evaluate the efficacy of the trial drugs in both the groups.

Drugs Dose:

Group A: Swarna Bindu   :   5 drops

Group B: Distilled water :   5 drops

Discussion -

Table1: Frequency distribution of patients according to Age.

The frequency distribution of patients according to Age is given below along with its bar graph.

Table No: 1

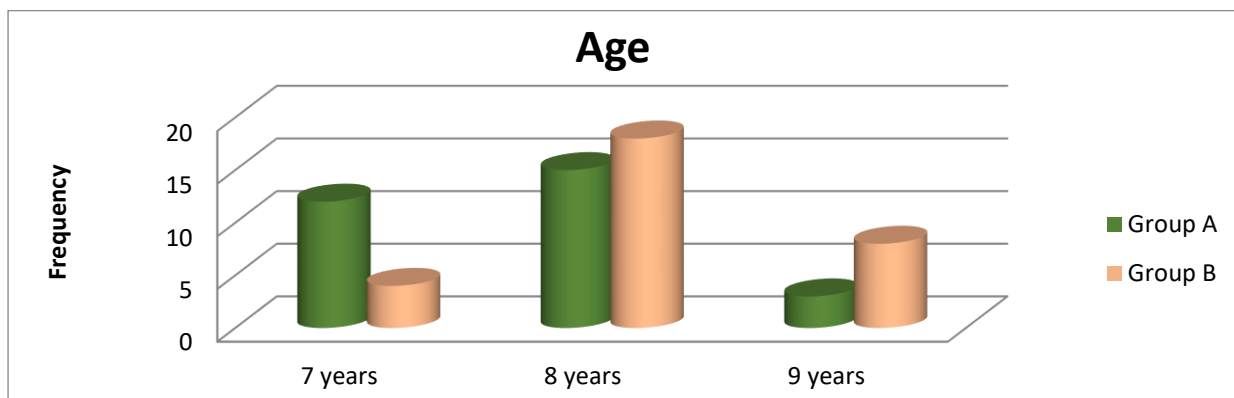| Age	Group A	Group B	Total	%
7 years	12	04	16	26.66
8 years	15	18	33	55.00
9 years	03	08	11	18.33
Total	30	30	60	100.00

Table2: Frequency distribution of patients according to G & D

The frequency distribution of patients according to G & D is given below along with it's bar graph.

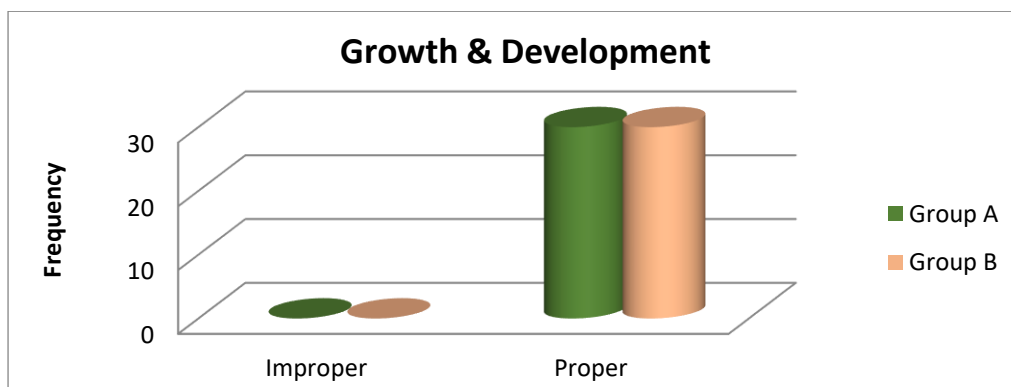| G & D	Group A	Group B	Total	%
Improper	00	00	00	00
Proper	30	30	60	100
Total	30	30	60	100.00

Table3: Frequency distribution of patients according to Academic Performance

The frequency distribution of patients according to Academic Performance is given below along with its bar graph.

Table No.3

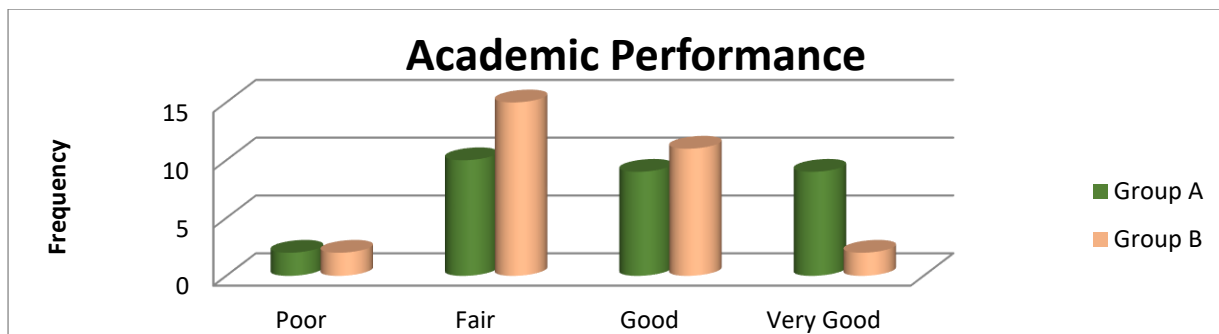| Academic Performance	Group A	Group B	Total	%
Poor	O2	02	04	06.66
Fair	10	15	25	41.66
Good	09	11	20	33.33
Very Good	09	02	11	18.33
Total	30	30	60	100.00

Table4: Frequency distribution of patients according to Manas Prakruti

The frequency distribution of patients according to Manas Prakruti
is given below along with its bar graph.
Table No. 4

Manas Prakruti	Group A	Group B	Total	%
Rajasik	11	6	17	28.33
Satvik	11	15	36	60.00
Tamasik	8	9	17	28.33
Total	30	30	60	100.00
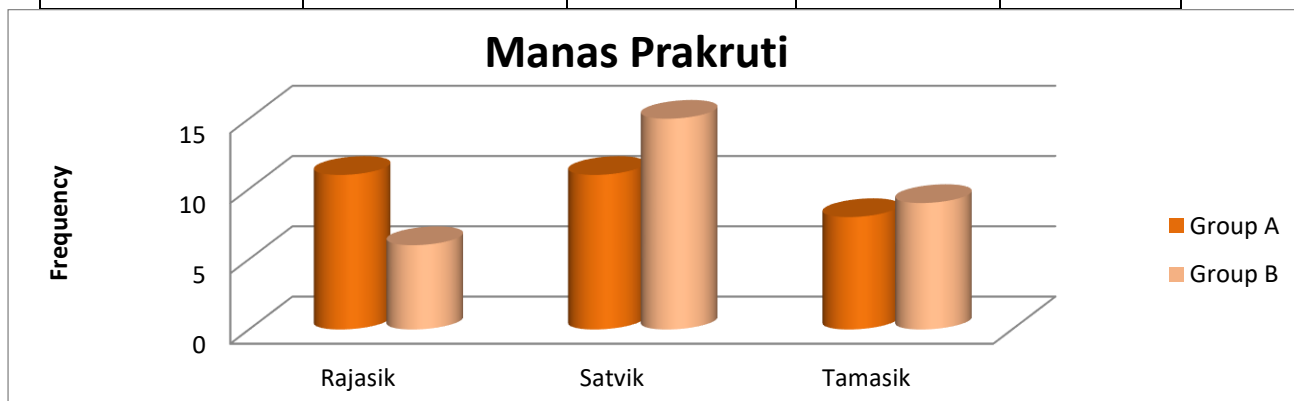
Effect of Swarnaprashana on Manas Bhavas

To test whether there is significant difference in effects of treatment of Group A&Group B.

To test the hypotheses,
The null hypothesis, H_0:
There is no significant difference in effects of treatment of Group A &
Group B.
Vs.
The alternative hypothesis, H_a:
There is significant difference in effects of treatment of Group A &
Group B. The effect of treatment on group A is greater than that of group B.

The test used is Mann Whitney test.

Test Applied for Comparison↓	Test Statistic	P value	Significance
Before Treatment	398.00	0.320	Not Significant
After Treatment	235.50	0.001	Significant
At Follow up	359.00	0.136	Not Significant

There is significant difference in effects of treatment of Group A &
Group B after treatment. The effect of treatment on group A is statistically significant the p value < 0.05 = the level of significance.

Effect of Swarnaprashana on IQ

To test whether there is significant difference in effects of treatment of Group A&Group B.

To test the hypotheses,
The null hypothesis, H_0:
There is no significant difference in effects of treatment of Group A &
Group B.
Vs.
The alternative hypothesis, H_a:
There is significant difference in effects of treatment of Group A &
Group B. The effect of treatment on group A is greater than that of group B.

The test used is Mann Whitney test.

Test Applied for Comparison↓	Test Statistic	P value	Significance
Before Treatment	429.00	0.756	Not Significant
After Treatment	436.00	0.836	Significant
At Follow up	434.50	0.818	Not Significant

There is significant difference in effects of treatment of Group A &
Group B after treatment. The effect of treatment on group A is statistically significant the p value < 0.05 = the level of significance.

Effect of Swarnaprashana on School Performance
To test whether there is significant difference in effects of treatment of Group A&Group B.
To test the hypotheses,
The null hypothesis, H_0:
There is no significant difference in effects of treatment of Group A &
Group B.

Vs.

Criteria	Effect	Group A	Group B

The alternative hypothesis, H_a:
There is significant difference in effects of treatment of Group A &
Group B. The effect of treatment on group A is greater than that of group B.

The test used is Mann Whitney test.

Test Applied for Comparison↓	Test Statistic	P value	Significance
Before Treatment	398.50	0.432	Not Significant
After Treatment	288.00	0.012	Significant
At Follow up	414.00	0.572	Not Significant

There is significant difference in effects of treatment of Group A &
Group B after treatment. The effect of treatment on group A is statistically significant the p value <
0.05 = the level of significance

Overall effect of Therapy

IQ	No Improvement	13.33%	43.33%
	Mild Improvement	30.00%	20.00%
	Moderate Improvement	16.66%	06.66%
	Markedly Improvement	40.00%	30.00%
Manas Bhava	No Improvement	10.00%	50.00%
	Mild Improvement	30.00%	26.66%
	Moderate Improvement	43.33%	13.33%
	Markedly Improvement	16.66%	10.00%
School Performance	No Improvement	16.66%	56.66%
	Mild Improvement	20.00%	23.33%
	Moderate Improvement	43.33%	10.00%
	Markedly Improvement	20.00%	10.00%

Discussion on probable mode of action

Pharmacological action of trial drug can be explained in two ways. Rasa, Guna, Veerya, Vipaka Prabhava and Agni. Drugs with predominantly Tikta rasa, Laghu, snigdha guna, sheeta veerya, and madhur Vipaka exerts beneficial effect on medha.

Swarna having madhura rasa, madhur Vipaka, shita veerya, snigdha, laghu guna and Tridoshar in action it is placed under the group of 'Rasayana.'

Madhu is a sweet food made up by nector from flowers, produced by honey bees. It is madhur, kashay rasa Ruksha, Shita, laghu and main yogvahi guna, sheeta veerya, madhur Vipaka. Madhu is a good source of multi-vitamin which are important in production of new cells i.e., vitamin B, C microelements like calcium, Iron, magnesium, phosphorus, potassium, sodium and zinc. Due to yogvahi Madhu adopts the properties of the other drug like Swarna Bhasma withoutlosing own properties and helps to add effectiveness of the whole yoga.

Ghrita having madhur rasa, madhur Vipaka Shita veerya. Snigdha, saumya, mridu guna. It is Sahstra veeryam, Medhya by action clinically Goghrita exhibits anti-collestric activity, memory enhancing activity. In the context of the snehapana, it is specially indicated for those increase in the intellectual level i.e., Dhi-smriti-medha.

Vacha possesses katu, Tikta rasa, laghu guna ushna veerya and katu Vipaka which exerted a beneficial effect on medhaand hence improved the IQ of brain patients. According to experiments neuroprotective properties and anti-depressant effect of Vacha may be contributing favorable to the memory enhancement effect.

Shankhpushpi has katu, Tikta, kashay rasa, pichhil, snigdha, guru, sara, guna with sheeta veerya madhur Vipaka and Medhya prabhava. It worked mainly by its Medhya prabhava and proved beneficial for medha and hence improved the IQ of the trial patients. It retards brain ageing and helps in regeneration of neural tissues due to anti-inflammatory effect besides producing antistress, adaptogenic and memory enhancing effect.

Properties of Shunthi having katu rasa, Laghu guna, Ushna veerya, madhur Vipaka. Due to this it acts as potent inhibitor of prostaglandins which enhance release of substance 'P' from trigeminalfibers. It is also effective in neuroprotectivity. Its cognitive enhancing effect may be due to its anti-oxidant and anti-inflammatory properties.

Haritaki having all five rasas except lavan. Due to its Haritaki is good nervine used in nervous weakness, nervous irritability. Due to Rasayana property it increases grasping power indirectly.

The Vidanga and Shati both plants possess Laghu, Tikshna guna, Ushna Veerya. These characters are mainly beneficial for good Medha i.e., to increase IQ properties of Vidanga and Shati shows the anti-convulsant and adaptogenic activities. It acts as neuroprotector.

Due to Tikta rasa, Laghu, Tikshna guna, Ushna Veerya Apamarg shows Shirovirechanatmak prabhava. Which normalize the function of vata dosha influencing the manas prakriti. It gives stimulus to normal functioning of Buddhi.

Due to Tikta, kashay rasa, guru, snigdha guna and madhur veepaka Guduchi exert beneficial effect for verbal learning, logical memory and cognition. It is well known for adaptogenic and anti-oxidant properties. Guduchi was reported to improve the intelligence quotient in children with subnormal intelligence quotient.

Madhur rasa and Vipaka, influences Indriya Prasannai.e., nourishing and augmenting all sensory perceptions at cytosolic as well as at gene expression level. Its improved strength and complexion, ameliorates alleviates vitiated pitta and vata and hence reduces Rajas i.e., anxiolytic and antistress activities or abnormal provocation of neurons and tamas i.e., neural inertia.

Swarna prashana has anti hypoxic effects, increases the circulation in the CNS and balance the level in the blood. Sthairyakara action gives neuro protection by directly or indirectly modulating activities of ATP asses. Swarnaprashanaexhibit interaction with GABa argic modulators. Sandhankara action gives the immune stimulants and increased the synthesis of Acetylcholine.

Depletion of neurotransmitters generally results in reduced mental performance with difficulty in concentrating, slowed reasoning, impairing recall typically, nootropics work by increasing supply of neuro chemical like serotonin, increases hippocampus release of acetylcholine, increase synoptic transmission as well as supply of oxygen and glucose by stimulating nerve growth. Combined action of the trial drug taken from clinical study prove to be effective for their action on memory, intellect, concentration contributed very well for improvement of mental functions as well as IQ.

Conclusion –

- ❖ Proper co-ordination of Mana, Atma, Indriya and contact with their Vishaya is essential for gyanotpatti.
- ❖ Swarnaprashana acts on medha by affecting all or one of them. It acts either by Rasa, Guna, Veerya, Vipaka properties or by prabhava. They act on vata, pitta, kapha dosha and satva, Raja and Tama guna.
- ❖ In groups A & B the IQ was tasted by "Good Enough's Draw A Man Test" along with the school performance marks given in gradation form and Manas Bhavas of the 60 children i.e. Dhi, Dhruti, Smruti.
- ❖ In Group A the IQ of children which is markedly improved is 40.00 % while their Manas Bhavas by 16.66 % and school performance shows markedly improvement in 20.00% children's.
- ❖ Also, in Group A the IQ of children which is moderately improve is 16.66 % while their Manas Bhavas by 43.33 % and school performance shows moderate improvement in 43.33 % children.
- ❖ While in Group B this improvement is not seen. The IQ improves only in 6.66% Manas Bhavas in 13.33 % and school performance improved in 10.00% children.
- ❖ While in Group B this improvement is not seen. The IQ improves only in 13.33% children, manas Bhavas in 10% children and school performance improved in 10% children.
- ❖ Thus, it can be concluded that the Swarna prashana has the effect on school going children after treatment and not after 1 month in follow up which may be due to short period of study.
- ❖ Trial should be carried out for minimum 6 months and with higher age group.
- ❖ The number of children can be increased in study.
- ❖ Trial on immunity of school going children should be carried out.
- ❖ Double blind Study can be conducted in the same age group.

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